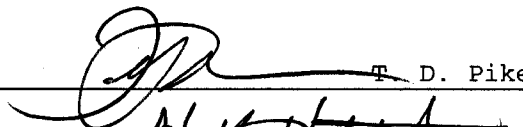
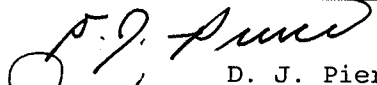

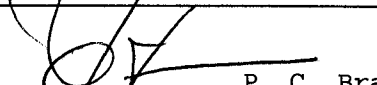
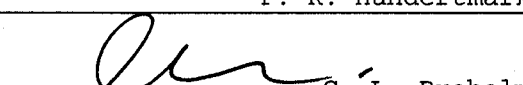
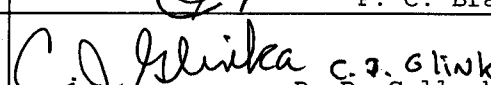
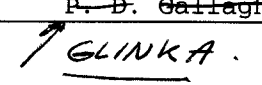


Engineering Change Request/Notice		Number		E	038-0005			
Number of attached pages		0						
Project	MACS		Affected Release Number(s):					
Originator	NCNR Project Participant		I	038-0009	S	038-xxxx	R	038-xxxx
Date	June 29, 2004		I	038-xxxx	S	038-xxxx	R	038-xxxx
Scope								
Change of supermirror alignment specification								
Purpose								
Take advantage of virtual pivot points in the design of the MBT drum to improve guide performance and reduce background								
Description								
The attached page contains a modification to section 2.6 of the top level specification concerning the motion required of the adjustable super-mirror guides.								
Impact (add more sheets if necessary)								
Performance			Schedule			Budget		
Estimate a 5% flux increase on the sample and a more uniform angular distribution. Also the background will be lower because the monochromatic beam aperture will more accurately match the required envelope of the incident beam.			Several days of design work were lost as the change ripples through some previous detailed design work. The change affects super-mirror drawings and drawings for the North and South MBT shields.			The man-power cost associated with the extra design work.		
Change Board (from Release)			Disposition		<input type="checkbox"/> approved		<input type="checkbox"/> disapproved	
1	 T. D. Pike		6	 D. J. Pierce		E 038-0005		
2	 P. K. Hundertmark		7	 P. C. Brand				
3	 C. L. Broholm		8	 C. J. Glinka P. D. Gallagher				
4			9	 GLINKA.				
5			10					

2.6 Monochromator to sample super-mirror guide.

From monochromator to sample shall be a converging super-mirror guide with critical angle no less than 3.5×10^{-5} . The guide shall extend from as close to the monochromator as possible until 250 mm before the sample. The inside height of the guide as a function of the distance, x , from the monochromator shall be given by

$$h(x) = h_s + (h_m - h_s) \left(1 - \frac{x}{L_{1r}} \right),$$

where $h_s=40$ mm is the sample height, $h_m=357$ mm is the monochromator height, and L_{1r} is the monochromator to sample distance at the $2\theta_M=90^\circ$ reference position. The inside surfaces of the super-mirror guides shall be tangents to the 2 cm diameter sample. When referred to the sample position the tolerance on this requirement shall be 0.5 mm. With the center of the sample as the virtual pivot point, the angle between the guide sides and the central reference line shall be independently variable under computer control from 0 to 3° with an accuracy of 0.03° . The guide shall be mounted on shielding material that functions as a beam defining apertures. The surface layer of this shielding shall have a high neutron absorption cross section. On the sample end of the guide this shielding shall extend until the end of the guide and on the monochromator side it shall be as long as possible. The incoherent scattering cross section of materials that are illuminated by the monochromator and visible from the sample shall be minimized to avoid diffuse and non-monochromatic contributions to the neutron flux on sample.

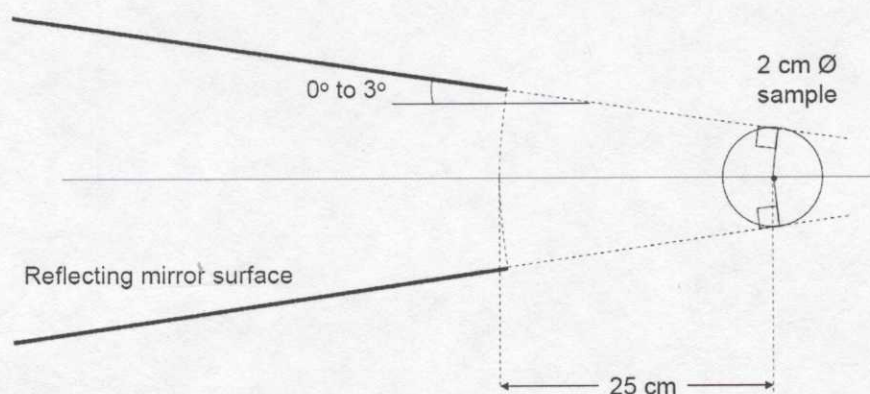


Figure 1. Conceptual sketch (top view) of the motion required for the sides of the super-mirror guide.